What is claimed is:

1. An optical component array comprising:

an input transmission line **(14)** capable of carrying an optical input signal including a plurality of channels;

a first wavelength selective input filter **(16)** optically coupled to the input transmission line, the first wavelength selective input filter configured to optically couple a first segment of the optical input signal to a first optical component **(17)**, and to optically couple a first remaining portion **(23)** of the optical input signal to

a second wavelength selective input filter **(30)**, the second wavelength selective input filter configured to optically couple a second segment within the first remaining portion of the optical input signal to a second optical component **(31)** and to optically couple a second remaining portion **(171)** of the optical input signal to a bypass output port **(172)**;

a bypass input port **(174)** optically coupled to a first wavelength selective output filter **(34)**, the first wavelength selective output filter being configured to optically couple at least an optical signal **(173)** from the bypass input port to a second wavelength selective output filter **(20)**, the second wavelength selective output filter being configured to optically couple at least a modified first segment ($\lambda 1'$) from the first optical component and the optical signal from the bypass input port to an output transmission line **(42)**.

2. The optical component array of claim 1 wherein the bypass input port is optically coupled to the bypass output port with an optical transmission line.

3. The optical component array of claim 2 wherein a bypass optical amplifier is disposed in an optical path coupling the bypass input port to the bypass output port.

4. The optical component array of claim 1 wherein the first optical component is a first optical amplifier and the second optical component is a second optical amplifier, and at least one of the first optical amplifier and the second optical amplifier includes a center tap output port and a center tap input port.

5. The optical component array of claim 4 further comprising a signal processing module disposed between, and optically coupled to, the center tap input port and the center tap output port.

6. The optical component array of claim 4 further comprising a shunt transmission line disposed between and optically coupled to the center tap input port and the center tap output port.

7. The optical component array of claim 4 wherein the first optical component is selected from the group consisting of an optical amplifier, a multiplexer, a de-multiplexer, a filter, a dispersion compensation module, a cross connection, an ADD/DROP module, an amplitude adjustment module, and a thru line.

8. An optical amplifier array for amplifying optical signals carried on an optical transmission network, the optical amplifier array comprising:

a plurality of amplifier paths arranged in a cascade, each of the plurality of amplifier paths including a wavelength selective input filter, an amplifier, and a wavelength selective output filter, wherein one of the plurality of amplifier paths further includes a center tap output port optically coupled to a signal processing module **(76)** optically coupled to a center tap input port, the center tap output port being disposed in the one of the plurality of amplifier paths between the wavelength selective input filter and the wavelength selective output filter, and

a second of the plurality of amplifier paths not including a signal processing module.

9. The optical amplifier array of claim 8 wherein the signal processing module is a dispersion compensation module.

10. An optical amplifier array for amplifying optical signals carried on an optical transmission network, the optical amplifier array comprising:

an input transmission line **(14)** capable of carrying an optical input signal including a plurality of channels within a transmission spectrum;

a wavelength selective input filter **(58)** optically coupled to the input transmission line, the wavelength selective input filter configured to optically couple a center segment of the transmission spectrum to a first amplifier **(60)** and to optically couple a remaining portion of the transmission spectrum to

a splitter **(62)**, the splitter configured to optically couple a first remaining portion of the transmission spectrum to

a second amplifier **(64),** and the splitter configured to optically couple a second remaining portion of the transmission spectrum to

a third amplifier **(66)**, the second amplifier configured to optically couple the first remaining portion of the transmission spectrum to a combiner **(86)** and the third amplifier configured to optically couple the second remaining portion of the transmission spectrum to the combiner, the combiner configured to optically couple the first and second remaining portions of the transmission spectrum to

a wavelength selective output filter **(88)**, the wavelength selective output filter being configured to optically couple the center segment, the first remaining portion of the transmission spectrum, and the second remaining portion of the transmission spectrum to

an output transmission line **(42)**.

11. A method of expanding an optical component array, the method comprising steps of:

providing an optical component array having a plurality of optical paths arranged in a cascade, each of the optical paths including a wavelength selective input filter optically coupled to an optical component optically coupled to a wavelength selective output filter, an input transmission line being optically coupled to the optical amplifier array at a first optical path of the plurality of optical paths and a bypass input port and a bypass output port being provided at a last optical path; and

installing an additional optical component path between the bypass input port and the bypass output port.

12. The method of claim 11 further comprising a step, after the step of providing an optical component array, of providing a second bypass path capable of having further optical paths installed within the second bypass path.

13. An expandable optical component array comprising:

an optical input transmission line **(14)** configured to optically couple a plurality of optical channels **(λ1, λ2, λ3, . . ., λN)** to

an interleaf demultiplexer **(182)**, the interleaf demultiplexer providing a first subset **(λ1, λ3, λ5, . . .)** of the plurality of optical channels to a first interleaf demultiplexer output **(186)**, the first interleaf demultiplexer output being optically coupled to a first optical component sub-array **(190)** at

a first wavelength selective input filter **(16)**, the first wavelength selective input filter optically coupling a first portion **(λ1)** of the first subset of the plurality of optical channels to

a first optical component **(17)**, the first optical component being optically coupled to

a first wavelength selective output filter **(20)**, the first wavelength selective input filter optically coupling a second portion **(171)** of the first subset of the plurality of optical channels to

a bypass output port **(172A)**, and the first wavelength selective output filter being configured to optically couple an optical signal **(173)** from

a bypass input port **(174A)** and optically coupling a modified first portion **(λ1′)** of the first subset of the plurality of optical channels to

a first interleaf multiplexer input **(187)**, the first interleaf multiplexer input being optically coupled to an optical output transmission line **(42)**.

14. The expandable optical component array of claim 13 further comprising:

a second interleaf demultiplexer output **(188)** optically coupled to at least a second bypass output port **(172B)** and the interleaf demultiplexer; and

a second interleaf multiplexer input **(189)** optically coupled to at least a second bypass input port **(174B)** and the interleaf multiplexer.

15. The expandable optical component array of claim 13 wherein the first optical component includes center tap ports.